Space Weather Forecast

Issued on Friday, 13 October 2023 at 01:47 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Ongoing Chance of Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been at Moderate levels over the past 24 hours, with a Moderate-class flare at 12/0458UTC from a region which has since rotated onto the far side. This was preceded by a long-period high Common-class flare from a second complex region, which at the time was located south-centre of the facing side. At present a CME does not appear to have been created as a result of this Common class flare.

There are currently seven sunspot regions on the visible disc. AR3460, AR3463 and AR3464 are all moderately magnetically complex, although the first two regions have decayed slightly through the period. AR3464 increased slightly in magnetic complexity, and was the only region to show an increase through the period. The remaining regions where generally smaller and magnetically simple.

There are numerous filaments on the Earth-facing disc at present, although none of the numerous CME's visible in available coronagraph imagery appear to be the result of a filament eruption. The majority of CME's appear to be from far sided sources, and unlikely to be Earth directed. However, a far sided event which started around 12/1000 UTC then spread to the Earth-facing side of the Sun, with an associated CME potentially Earth-directed. Analysis will be undertaken now that imagery has become available again.

Solar Wind / Geomagnetic Activity: Solar winds continue to show a slow regime, although the solar wind speed rose a little within background levels. The associated magnetic field was mainly smooth and also weak, although briefly reaching moderate levels at times through the evening, with an unremarkable north-south component throughout.

The net effect of the above solar wind measures was Quiet geomagnetic activity throughout.
Energetic Particles / Solar Radiation: No solar radiation storms were observed, with no obvious minor response to any of the observed flare events of the period.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a continuing chance of Moderate-class flares through the four-day period, partly from the regions currently on the visible disc but also from regions that are likely to rotate onto the visible disc with the period.

Solar Wind / Geomagnetic Activity: The CME associated with a mid-ranking Common-class flare from 08 Oct is now though to have missed Earth. At present no Earth directed CME's are expected. However, analysis will be undertaken on some CME's that are apparent in chronograph imagery, which has now returned.

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A fast wind that was expected is now also well overdue and unlikely to arrive. However, late on day 4 (16th) a solar wind enhancement may arrival from another coronal hole feature. Therefore geomagnetic activity is currently forecast to remain at predominantly Quiet levels, with a chance of isolated Unsettled intervals until late day 4. Then activity may increase to become Unsettled to Active with a chance of minor or moderate geomagnetic storms developing.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

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Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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